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ABSTRACT

This is the master descriptive document and teacher's guide for a series of urban environmental education models. The series is intended for grades 6-9 but may be modified for older or younger children. Each module addresses a specific aspect of urban environmental quality of life. The modules are interdisciplinary but draw primarily on natural and social sciences. This guide contains a summary of the curriculum features, an overview of each module, an explanation of the curriculum module guidelines for writing activities, field test evaluation instruments, and additional resources to supplement the modules. (RE)

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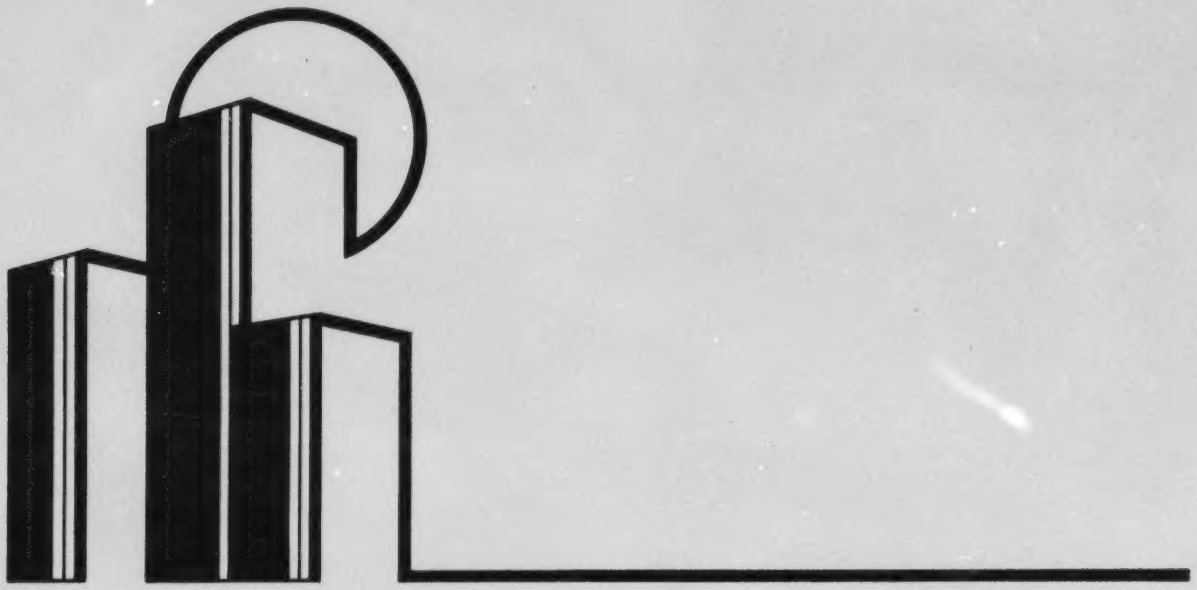

Urban Environmental Education Project

Curriculum Series Overview and Teaching Guide

developed by Catherine Cornbleth and John C. McGrail

SE 030 511

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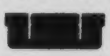

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URBAN ENVIRONMENTAL EDUCATION PROJECT

Curriculum Series Overview & Teaching Guide

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Curriculum Series Overview & Teaching Guide

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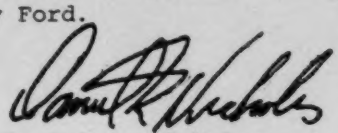
The Urban Environmental Education Project (UEEP) has created curriculum on environmental problems in an urban setting through funding provided by the United States Office of Education. Products which include eight curriculum modules, accompanying student materials, and this Overview/Guide have evolved from the joint effort of many individuals and several organizations. The organizations include the Allegheny Intermediate Unit, the University of Pittsburgh School of Education, and the Wilkinsburg, Shaler, Quaker Valley, and Highlands School Districts in Allegheny County, Pennsylvania. Among the many individuals who have participated in the UEEP to date, particular thanks are extended to the module developers, the field test teachers and their students, and the project consultants. And, we very much appreciate the assistance of our colleagues at the Allegheny Intermediate Unit and the University of Pittsburgh, without whose expertise and patience the coordination and successful completion of the UEEP would not have been possible -- a special thank you to Geri Sloan, Debbie McDonough and Patty Ford.



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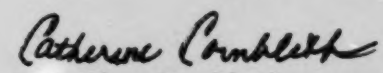

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INTRODUCING THE UEEP CURRICULUM SERIES

The URBAN ENVIRONMENTAL EDUCATION PROJECT Curriculum Series, funded by the U. S. Office of Education, consists of eight teaching modules and this Overview/Guide. The modules were created and field-tested during the 1978-79 school year and revised during the summer of 1979. Each module develops selected aspects of a crucial urban environment-quality of life issue, drawing primarily on the natural and social sciences. Intended for middle-junior high school students, the modules also may be suitable for older or younger students.

Module Format. The modules (which are three-hole punched for easy, flexible use) contain teacher background information, a knowledge pretest for students, and plans for four to five activities, including master copies of student materials such as handouts, worksheets, and maps. The concluding activity in each module incorporates a decision-making process that integrates previously studied multidisciplinary (science, math, and communication as well as social studies) knowledge, beliefs, and skills.

Flexible Use. Each module is intended for one-two weeks of class time, depending upon student interests, abilities, and the extent to which supplementary materials and activities are employed. The modules can be used as units (additions, substitutes, or supplements) in an on-going program or, together, they might constitute a one semester course. Alternatively, individual activities might be selected for class use or for small group use as remediation or enrichment.

The UEEP module titles (and developers) are:

I. Energy Generation: Sources and Consequences (Barbara Biglan)

II. Energy Conservation: What Are the Options? (Albert P. Nous)

III. Urban Transportation: Where Are We Going? (Ellen Bell)

IV. Community Heritage and You (Ernest B. Dorow)

V. Urban Air Quality: At What Costs (Barbara Biglan & Gabriele Ziccarelli)

VI. Solid Waste: Trash or Treasure? (Barbara Biglan)

VII. Urban Ecology: Our Future Together (Albert P. Nous and Barbara Biglan)

VIII. Planning Your Urban Environment (Ellen Bell)

While the sequence of the modules (or of activities within a module) is not fixed, it is desirable that students have some familiarity with energy sources (Module I) before considering energy conservation (Module II) and that students have studied several urban environmental issues before considering urban planning (Module VIII). Similarly, the decision-making activity in each module cannot be meaningfully completed unless students have acquired relevant knowledge and skills and considered the underlying values and possible outcomes.

Major Objectives. Not only are students expected (a) to acquire knowledge relevant to selected urban environmental issues, (b) to display more favorable beliefs toward environmental concerns and means of resolving environmental issues, and (c) to develop social reasoning or critical thinking skills, but they also are expected (d) to integrate and apply their learning in these areas by participating in a process of informed decision-making.

Learning Activities and Materials. To help students obtain the major objectives noted above and the more specific objectives indicated in each module, a variety of individual, small group, and whole class activities are provided. However, the activities do have some common characteristics. Perhaps most important is their encouragement of active student participation through direct experiences and personal applications. Many of the activities are community based, using local examples and resources; at the same time, multicultural and global perspectives are incorporated in each module. (While the activities focus on Allegheny County, Pennsylvania, they are readily adaptable for use in other locales.) In all of the activities, students are involved in using or applying as well as obtaining information. (Field test teachers also described the activities as highly motivating and success oriented because they incorporate and build on students' experiences, knowledge, and beliefs.)

Each activity includes a brief statement of objectives and organizing ideas, a listing of student materials (provided in the module and/or a separate Student Materials Packet), a description of additional resources, and an outline of suggested procedures. The accompanying student materials are varied -- surveys, readings, demonstrations, maps, charts, worksheets. A sample from Module II, Energy Conservation, is provided at the end of this Overview Guide.

And More. In the following sections of this Overview/Guide, you will find:

- a summary of UEEP module features
- overviews of each of the modules
- an explanation of the UEEP decision-making model
- guidelines for writing activities
- field-test evaluation instruments and suggestions for use
- additional resources to supplement the UEEP modules

Summary of UEEP Module Features

Components

.overview and teacher background information
.activity preview
.knowledge pretest for students
.four-five activities, including student materials

Audience

.teachers and students in grades 6 - 9
.social studies, science, language arts

Flexible Use

.one-two class periods per activity (one-two weeks per module)
.variable sequence
.adaptable to diverse settings

Goals

.knowledge acquisition, examination of values, and development of communication and reasoning skills -- coordinated within a decision-making framework

Content Focus

.urban environmental issues
.multidisciplinary knowledge, drawn primarily from the natural and social sciences

Learning Activities and Materials

.personalized, incorporating students' experiences and beliefs
.active student involvement
.skill-oriented
.community-based
.multi-media

Module I. Energy Generation: Sources and Consequences

Energy is costly in terms of dollars, safety, efficiency, and environmental effects. With this module, students examine our current energy uses and resources and then explore future possibilities.

Contents	Notes
ACTIVITY 1. ENERGY - WHAT IS IT? Worksheets and demonstrations introduce energy concepts and suggest the nature of the energy crisis.	* * EXTRA * * Optional Pendulum Demonstration (p. 10) requires: 20" of string weight for string
What is Energy? What Difference Does It Make? -list 5 ways in which we use energy (Part A); distinguish kinetic from potential energy (Parts B and C)	Handouts SM 1.1-1.2 (distinguish between kinetic and potential energy) 10 Books or Dominoes (Part D)
What Forms of Energy Are There? -interpret diagrams on energy transformation (Part E) and energy losses (Part F); consider what we could not do without electricity (Part G)	Handouts SM 1.3-1.4 (fact sheets) SM 1.5 (imagine what might happen if there was no more electricity)

Contents	Notes
ACTIVITY 2. ENERGY GENERATION - WHAT ARE THE OPTIONS? Students interpret a circle graph, describe their own energy consumption, and identify criteria for evaluating energy sources.	Handouts SM 2.1-2.2 (interpret circle graph and describe personal energy consumption) SM 2.3 (energy questions for the future) SM 2.4-2.10 (individual fact sheets on energy sources; can be used to help students develop expertise for the "Energy Conference 1984," Activity 5) Oil SM 2.4 Coal SM 2.5 Nuclear SM 2.6 Solar SM 2.7 Geothermal SM 2.8 Moving Water SM 2.9 Wind SM 2.10
ACTIVITY 3. ENERGY RESOURCES "NEW" AND OLD - WHERE DO THEY COME FROM? Using maps and charts, students create a composite map showing "rich" and "poor" energy areas in the United States.	Handouts SM 3.1 (U. S. outline map) SM 3.2-3.6 (U. S. energy resource maps)

Contents	Notes
ACTIVITY 4. ENERGY AND MY FUTURE - WHERE DO I STAND? After identifying the issue(s) and goal (SM 4.1) and reviewing the options (SM 4.2), students use the Decision-Making Map to summarize available information and reach a decision regarding future energy sources.	Handouts SM 4.1-4.2 (define issues and goals) Decision-Making Map Overhead & Decision-Making Map Transparency
ACTIVITY 5. ENERGY CONFERENCE 1984 Interest groups present their cases at DOE hearings using fact sheets from Activity 2 (SM 2.4-2.10).	

Module II. Energy Conservation: What Are the Options?

To what extent can technology ease the energy crisis? How much difference will individual conservation efforts make? With this module, students explore and evaluate alternative means of conservation.

Contents	Notes
ACTIVITY 1. CHECKPOINT Students use a checklist to observe energy use at home; an optional fact sheet provides additional background information.	Handouts SM 1.1-1.3 (checkpoint survey - homework) SM 1.4 (fact sheet)
ACTIVITY 2. TEMPERATURE, SPACE, AND INSULTATION MATERIAL - HOW DO THEY AFFECT ENERGY USE? Demonstrations and observations are used to evaluate energy use and various types of insulation; an optional fact sheet provides additional background information.	Handout SM 2.5 (fact sheet) For Demonstrations A and B, the following items are needed: 3 graduated cylinders or measuring cups 1 dozen ice cubes (or very hot water) 4 celsius thermometers
Space and Temperature -identify energy and space relationships (Demonstration A)	Handouts SM 2.1-2.2 (observation sheets for Demonstration A)

Contents	Notes
	For Demonstration A, the following also are needed: 3 boxes or coffee cans (with lids) of similar construction but different sizes tape measure or yard (meter) stick
Insulation, Space, and Temperature -compare effects of different types of insulation materials (Demonstration B)	Handouts SM 2.3-2.4 (observation sheets for Demonstration B) For Demonstration B, the following also are needed: 3 small boxes or coffee cans (with lids) of similar construction and size 3 larger boxes or cans (without lids) of similar construction and size styrofoam, wool-type, and another form of insulation, e.g., crushed paper
ACTIVITY 3. BLACKOUT? What electrical appliances are used during what hours in your home? What effects would limited blackouts have on your life and household practices?	Handouts SM 3.1 (survey of home electrical use - homework) SM 3.2-3.3 (questions for data interpretation from survey and inferring the effects of a "brownout")

Contents	Notes
ACTIVITY 4. WHO'S SELLING/BUYING ENERGY USE? Students analyze ads to determine their likely influence on energy use and energy conservation.	Handout SM 4.1 (questions for interpreting advertisements)
ACTIVITY 5. ENERGY CONSERVATION: WHAT SHOULD WE DO? After summarizing information acquired in previous activities, students establish energy conservation goals, examine alternative means of reaching their goal(s), and reach a personal and/or public decision	Decision-Making Map Overhead & Decision-Making Map Transparency

Module III. Urban Transportation: Where Are We Going?

Every "solution" to a problem has some drawbacks. The bicycle, for example, is an economical and pollution free alternative form of urban transportation, but it does have limitations. With Module III, students examine environmental problems associated with urban transportation options and consider bikeways as one possibility.

Contents	Notes
ACTIVITY 1. TRANSPORTATION IN URBAN ENVIRONMENTS Using charts and graphs, students evaluate various forms of transportation and formulate quality of life goals for transporation in the urban environment; extra skill development experiences are included.	The Decision-Making map can be introduced here to assist students in clarifying the environmental issues and identifying quality of life goals. The map also will be used at the end of the module. Handouts SM 1.1-1.2 (evaluate various forms of transportation) SM 1.3-1.4 (read and interpret bar graphs) SM 1.5-1.6 (more skill development activities related to urban transportation) SM 1.7 (introduction to "pedestrianism")
ACTIVITY 2. WHO WANTS A BIKEWAY? In this activity, students assess community demand for a bikeway and identify advantages and disadvantages of bikes as a mode of urban transportation. Who Wants a Bikeway? -read for information	This activity will require more than one period. It involves introducing the questionnaire, administering the questionnaire (out-of-class), and tabulating the results. Handouts SM 1.1 (fact sheet)

Contents	Notes
Bikeway Questionnaire -administer questionnaires to community residents Bikeway Questionnaire Results -tally and interpret findings (involves some math)	Handout SM 2.2 (questionnaire - multiple copies needed for each student) Handouts SM 2.3-2.4 (tally sheets for bikeway questionnaire)
ACTIVITY 3. THE BIKEWAY AND THE ENVIRONMENT Using maps, the students interpret the effects of the environment on a bikeway -use traffic (Part A), population (Part B), and proposed bikeway route (Part C) maps to identify and explain possible bikeway routes -interpret table in conjunction with population map to determine effects of "slope" on bikeway routes -interpret a table (Part D) regarding climate (Part E) and determine effects on bicycling -identify cause-effect relationships (Part F)	Activity 3 may require more than one class period; SM 3.5-3.8 may be used as homework assignments. Handouts SM 3.1-3.4 (map reading and interpretation) SM 3.5-3.7 (climate table and questions for interpretation) SM 3.8 (cause-effect review questions) Overhead and 3 Map Transparencies

Contents	Notes
ACTIVITY 4. DESIGNING A BIKEWAY Students design a local bikeway after examining laws and ordinances that apply to bicycles, parking, and other factors in bikeway construction and use.	Activity 4 offers many options for implementation. It might be completed in one class period or last for several days. The class as a whole could study all aspects of the bikeway, or small groups could study just one aspect once the route is identified. local map - a simple drawing is sufficient yard (meter) stick and a bicycle - or assign SM 4.6 as homework drawing materials - colored pencils, paper, crayons
What Does a Bikeway Look Like? -determine the route for a neighborhood bikeway	Handouts SM 4.1 (fact sheet)
Bikeway Recommendations -evaluate group presentations; after groups complete their studies, students summarize and evaluate each group presentation	SM 4.2 (bikeway proposal summary sheet)
Laws and Ordinances -review local and state laws on bicycle use	SM 4.3-4.5 (fact sheets)
Space Requirements -determine how much space a bicycle lane requires	SM 4.6 (space required for a bicycle)
Bikeway Classifications -evaluate classes of bikeway	SM 4.7-4.8 (different classes of bikeways)

Contents	Notes
Signs and Markings -select and/or design signs for bikeway route Parking and Security -select parking and security facilities	SM 4.9-4.11 (fact sheets) SM 4.12-4.13 (parking and security options for bicycles) Groups present their findings, perhaps in a "town meeting" format, using SM 4.2 as a summary-evaluation sheet.
ACTIVITY 5. SHOULD ALLEGHENY COUNTY CONSTRUCT A BIKEWAY? In this final activity, students estimate costs and reach a decision regarding the desirability of building a bikeway.	Handouts SM 5.1-5.2 (calculate cost of bikeway construction) Decision-Making Map Overhead & Decision-Making Map Transparency

Module IV. Community Heritage and You

One's community - past, present and future - is shaped by the people who comprise its human environment. With this module, students examine their communities and cultures, including their own values.

Contents	Notes
ACTIVITY 1. WHERE ARE WE? In this first activity, students locate their own community in relation to other communities and major transportation routes.	area or county map Handouts SM 1.1-1.4 (maps and questions for hypothesis generation)
ACTIVITY 2. WHAT IS LEFT - THE MONUMENT SEARCH? Students take a closer look at the built environment of their community.	Handouts SM 2.1 (fact sheet) SM 2.2-2.3 (monument search guide; the individual search for monuments in the community may be a good weekend assignment, followed by small group work on Monday)

Contents	Notes
ACTIVITY 3. YOU AND YOUR FAMILY Construction of a Family Tree and interpretation of it are the major components of this activity.	The Family Tree can be as elaborate or as simple as you wish, but provide a few days advance notice so students can gather information from their family members. Handouts SM 3.1 (background information and instructions) SM 3.2-3.3 (family tree outline and questions for interpretation) SM 3.4 (family history writing assignment)
ACTIVITY 4. VALUES: TRADITION AND CHANGE In this activity, students distinguish between value indicators and values, compare personal and community values, and note changing values.	Handouts SM 4.1 (background information and instructions) SM 4.2 (values chart)
ACTIVITY 5. COMMUNITY FUTURES The future of a community is put up for discussion and student decision-making.	* * EXTRA * * This activity could be elaborated by selecting a Planning Commission and holding a public hearing with students presenting different points of view. Handout SM 5.1 (case study and questions for decision) Decision-Making Map Overhead & Decision-Making Map Transparency

Module V. Urban Air Quality: At What Costs?

What trade-offs are we willing to make for clean air? How is pollution created? minimized? With this module, students establish priorities and make reasoned choices regarding air quality.

Contents	Notes
ACTIVITY 1. THE AIR IS EVERYWHERE - BUT WHAT IS IT? Normal, unhealthful, and hazardous air quality are defined, and students interpret PSI readings.	
The Air is Everywhere - But What Is It?	Handouts SM 1.1 (fact sheet) SM 1.2 (interpret tables)
What's the PSI, Ocean Dweller?	Handouts SM 1.3 (fact sheet) SM 1.4 (interpret tables)
	* * EXTRA * * slide series on Pittsburgh Air Quality, Past and Present (see script in Teaching Guide)

Contents	Notes
ACTIVITY 2. WHO ARE THE OFFENDERS? Students identify sources of air pollution, from cigarettes to industrial smoke stacks.	Handouts WANTED POSTERS, SM 2.4-2.6, are fact sheets that might be reviewed before using SM 2.1-2.3 SM 2.1-2.3 (identify and analyze air pollutants)
ACTIVITY 3. AIR QUALITY - WHERE? Using a county map, students identify present air quality monitoring stations and list possible pollution sources in those areas. Measuring Air Quality: What and Where? -locate air quality monitoring stations on map -propose additional monitoring sites How Clean Is Our Air? -from chart (SM 3.1), locate areas with low air pollution	Handouts SM 3.1 (information table) SM 3.2 (map work) Handout SM 3.3 (questions for data interpretation and discussion of desirable place to live)

Contents	Notes
ACTIVITY 4. INVERSION - A DEADLY CONDITION Information about inversions and examples are provided, and students consider how the effects of inversion can be minimized.	
What's An Inversion? What Difference Does It Make? -read for information	Handout SM 4.1-4.2 (background information)
Graphing an Inversion -graph information in chart form	Handout SM 4.3 (graph activity)
ACTIVITY 5. POLLUTION PREVENTION - WHERE DO WE STAND? Students establish goals for air quality and determine the trade-offs needed to achieve their goals.	
Pollution Prevention: At What Costs? -read for information	Handouts SM 5.1-5.2 (background information)
Trade Offs -establishing priorities	Handout SM 5.3 (questions for identifying priorities and trade-offs) Decision-Making Map Overhead & Decision-Making Map Transparency

Module VI. Solid Waste: Trash or Treasure?

How likely are we to be buried by the mountain of trash we create each day? What are the problems with various methods of disposal and recycling? With this module, students examine and evaluate the issues in environmental, economic, and political terms.

Contents	Notes
ACTIVITY 1. SOLID WASTES: WHERE DO THEY COME FROM? In this activity, students identify sources of solid waste from a personal standpoint -- what did I throw away yesterday? The past (1900) to present (1970's) tonnage of solid waste is compared to promote discussion of change in product and container use.	Handouts SM 1.1 (compiling a personal garbage list) SM 1.2 (interpreting a circle graph) SM 1.3 (interpreting a line graph)
ACTIVITY 2. THE GARBAGE GAME The garbage Game has two phases: phase 1 is production or collection; phase 2 is disposal. The game reviews sources of solid waste and introduces various disposal methods.	Phase 1 can be used after Activity 1. Phase 2 can be used either before or after Activity 3, which deals with means of solid waste disposal. Handout SM 2.1 (collection sheet for game) Garbage Game Board die or spinner & markers (buttons, chips)

Contents	Notes
ACTIVITY 3. SOLID WASTES: WHAT ARE THE DISPOSAL OPTIONS? Explanations of various existing and proposed disposal activities are provided, and students evaluate each disposal method.	Handouts SM 3.1 (introducing disposal options) SM 3.2 (fact sheet) SM 3.3 (chart for evaluating disposal options)
ACTIVITY 4. ONE COUNTY'S DREAM FOR DISPOSAL This concluding activity introduces Allegheny County's Master Plan for waste disposal. From the given information, students identify a quality of life goal, examine options, and support the decisions made by Allegheny County planners or propose an alternative plan.	Handouts SM 4.1-4.2 (fact sheets) Decision-Making Map Overhead & Decision-Making Map Transparency

Module VII. Urban Ecology: Our Future Together

Costs and benefits of urban development are no longer computed solely in terms of dollars and cents. Today we also look at the cost or impact on the environment. With this module, students undertake an environmental impact study using an urban redevelopment proposal as a case study.

Contents	Notes
ACTIVITY 1. SO WHAT'S ECOLOGY? Using urban examples, students develop working definitions of ecology and ecological relationships.	Handout SM 1.1 (classroom mapping)
ACTIVITY 2. BEFORE IT'S TOO LATE Given a map of an actual construction project plan, a brief project description, and an environmental impact checklist, students identify the likely environmental effects of the proposed project.	Handouts SM 2.1 (project description) SM 2.2 (project map) SM 2.3-2.5 (environmental impact checklist)

Contents	Notes
ACTIVITY 3. ENVIRONMENTAL IMPACT: BENEFITS AND DISADVANTAGES Students summarize and evaluate their findings regarding the environmental impact of the redevelopment proposal.	Handout SM 3.1 (Environmental Impact summary chart)
ACTIVITY 4. FUTURE CHOICE Students review and synthesize data about urban ecology and the project plan as a basis for decision-making.	Can be related to, or contrasted with, Module IV, Activity 5, "Community Futures" Decision-Making Map Overhead and Decision-Making Map Transparency

Module VIII. Planning Your Urban Environment

Urban planning is not a new idea, but it is more complex today. The Chinese who planned their capitals almost 3000 years ago, for example, did not have to confront many of the environmental problems facing us today. With this module, students examine some planned communities here and abroad and then plan their own EnviroCity.

Contents	Notes
ACTIVITY 1. NEW TOWNS: HERE As an introduction, students read about two new towns in the United States.	Handouts SM 1.1 (introduction) SM 1.2-1.4 (background information) SM 1.5-1.6 (questions for review)
ACTIVITY 2. NEW TOWNS: THERE Students read about new towns in other countries and compare them with new towns in the United States.	Handouts SM 2.1-2.2 (background information) SM 2.3 (chart for comparing new towns here and there) * * EXTRA * * Slides of Planned Cities

Contents	Notes
ACTIVITY 3. THE FUTURE URBAN ENVIRONMENT This activity focuses on technological advances in transportation, housing, energy generation and waste disposal.	Note topics dealt with in previous modules -- transportation, energy, waste disposal, and ecology. Divide class into four planning groups, and assign one area to each group for study and presentation (to be summarized with SM 3.6). Handouts SM 3.1-3.5 (fact sheets) Transportation Energy Housing Waste Disposal SM 3.6 (summary and recommendations chart)
ACTIVITY 4. ENVIROCITY Students design a quality urban environment, EnviroCity.	After each individual has developed some input for the plans, small groups might be assigned to work on one specific aspect of the plan (e.g., transportation, housing, waste disposal, energy, recreation) for EnviroCity. This activity can be as simple or as complex as you and/or students wish. Each group may plan a complete EnviroCity or the class may complete one as a group project. Handout SM 4.1 (fact sheet)

Contents	Notes
	Large sheets of paper - one for each group colored pencils rulers unlined paper (8x11) for each student
ACTIVITY 5. EVALUATING ENVIROCITY Students present their plans to the class for evaluation and analysis.	Handout SM 5.1 (evaluation sheet for EnviroCity project) Decision-Making Map Overhead & Decision-Making Map Transparency

DECISION-MAKING: THE UEEP MODEL

Informed decision-making is both a major goal and the framework for integrating various components of the UEEP -- knowledge about urban environmental issues, favorable attitudes toward environmental concerns, and critical thinking skills. Decision-making can be defined simply as choosing from two or more options. Informed decision-making bases choice on systematic examination of the available evidence and one's goals (or values). Decision-making situations are those where the "best" choice is unclear or problematic, calling for decision-making not only by business and government leaders but also by informed citizens. Consequently, informed decision-making is the unifying theme of the UEEP and the long range goal that the modules are intended to help students reach. Without this decision-making focus, the module activities would remain fragments that students likely would find less meaningful (and more easily forget).

Given the age and experiential backgrounds of most middle-junior high school students, the decision-making model incorporated in the UEEP is necessarily a simplified one. (However, it easily can be elaborated for older or more sophisticated students to incorporate additional critical thinking skills.)

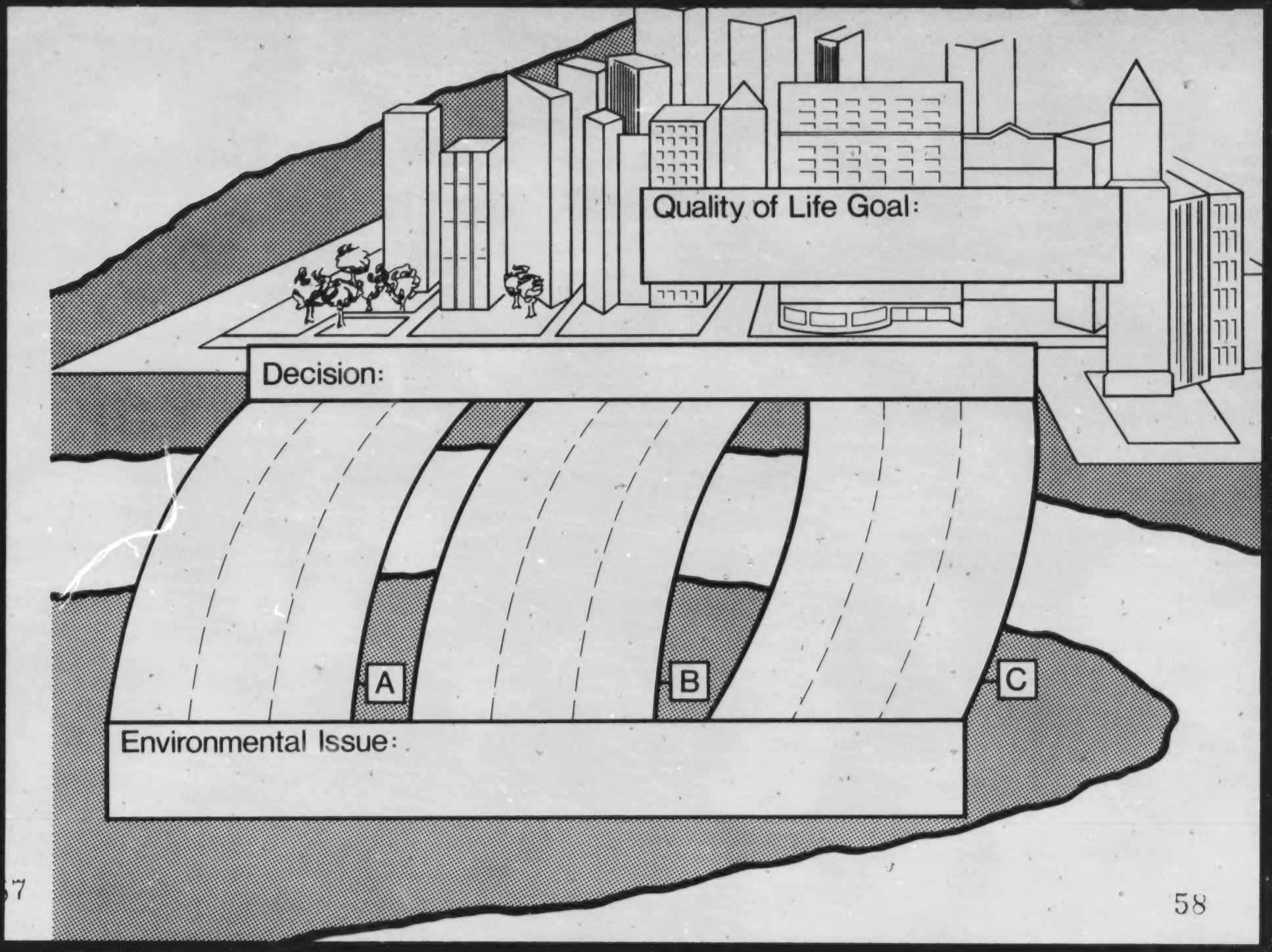
The initial activities in each module provide background information, indicate major questions and issues, suggest alternative responses and likely consequences, and generally involve students in "sorting out" information relevant to the issues raised. The last or next-to-last activity in each module introduces the decision-making process and map. The map is a

visual representation intended to help students conceptualize the decision-making process. Both a handout master and a transparency are provided. The decision-making map is an adaptation of a downtown district in which three rivers converge. Students first identify the environmental issue (bottom of the map) and their quality of life goal (across the river, in the city, at the top of the map). Then students consider alternative routes (bridges A, B, C) to reach their goal and the likely consequences of each (lanes on the bridges). Finally, they make an informed decision, consistent with the available evidence and their goal.

In the first modules, worksheets also are provided to guide students' identification of the environmental issue(s) and quality of life goal(s) -- and their recognition of the need for trade-offs and compromise (see, for example, SM 4.1 in Module I). Later modules provide less guidance as students are expected to assume increasing responsibility for decision-making.

The decision-making activities can be implemented in an individual, small group, or whole class format -- or any combination. At least initially, a group format seems desirable in order that students might share and challenge ideas and that any confusion or misconceptions about the process or subject matter can be clarified immediately. However, students should not be pressed to reach consensus, bow to the majority, or seek "right answers." They should be able to agree to disagree and to support their decisions.

For your information in stimulating and moderating decision-making discussions, the decision-making model is outlined below, and guiding questions for each phase of the process are suggested. However, it is not intended that these or similar questions be used in a fixed sequence.


Quality of Life Goal:
Decision:
A
B
C
Environmental Issue:

Informed decision-making is not a mechanistic, lock-step process. What is important is that all aspects (issue, goal, options, consequences) be considered and clarified before a decision is made.

Decision-Making Model

Phase	Purpose
ENVIRONMENTAL ISSUE	-initiation and awareness -problem identification and clarification -data intake
Guiding Questions:	
What is the issue? What kind of issue is it? (social? scientific?)	
Whose problem is it? Who is affected? How? Who is responsible for the problem? In what ways? Who has decision-making power?	
QUALITY OF LIFE GOAL	-awareness and valuing -determining priorities
Guiding Questions:	
What is our goal? Why is that desirable? How does that contribute to the "quality of life"? What does that suggest about what you value?	
OPTIONS (ALTERNATIVE ROUTES)	-hypothesizing (brainstorming)
Guiding Questions:	
What might be done to resolve this conflict? Who might do it? Which individuals and groups support (each option)?	

Decision-Making Model - continued

Phase	Purpose
LIKELY CONSEQUENCES	-data intake and organization -interpreting information

Guiding Questions:

What might happen if that was done? Positive side-effects? (advantages?) Negative side-effects? (disadvantages?)

(Consider different kinds of effects -- political, economic, technological, social, personal -- including health and general well-being, on the individuals and groups identified previously.)

What are the costs? Benefits? Trade-offs?

DECISION	-negotiation and compromise -choosing (synthesis and conclusion)

Guiding Questions:

Which option is most compatible with our goal? In what ways?

ACTION (optional)	-application (testing and evaluating decisions)

Guiding Questions:

How might we act on our decision? What are the possibilities? How feasible is that possibility? Costs? Likelihood of success?

How well would our decision work in (another situation or context)?

GUIDELINES FOR STRUCTURED WRITING ACTIVITIES

Brief writing assignments are an integral part of the UEEP modules, and there are opportunities for more extended writing experiences -- both for practice in communicating ideas and for evaluation purposes. While the UEEP writing activities have been designed to be consistent with what is known about the development of writing skills and "good writing," additional information is provided here to assist teachers who desire to emphasize writing.

Helping students to develop their writing skills means more than assigning, reading, and correcting a mass of "compositions." Writing or "composing" is a process that teachers can influence at a number of different points and in a number of different ways. The following guidelines are suggested by Professor Stephen M. Koziol, Jr. of the University of Pittsburgh.

1. It is helpful to think of the composing process as involving three major phases: prewriting, production, and response. In structuring writing assignments, there should be specific plans for each of these three major phases of the composing process.
   a. Prewriting refers to that period in which the student structures the ideas, impressions, details, feelings, etc. that will be incorporated in the written product. In practice, prewriting includes time for "conceptualization" or the forming of many possible ideas and details as well as time for "reflection" or the selecting and organizing of the ideas and details that are to be used in the writing.

b. Production refers to that period in which the student is actually writing, including the time for revising and editing initial drafts.

c. Response refers to the many different ways that students can get opinions, reactions, and judgments about what and/or how they have written.

2. Good writing does not just happen. At the heart of a good writing experience is having something to say and having an idea how to say it. You can help students formulate their ideas by providing appropriate prewriting activities. These can range from holding class discussions on topics students are to write about to presenting professional or "exemplar" models, from giving students a detailed topical outline to having students compile personal reaction/impression lists, and from having students participate in various types of enacting exercises to taking students on special field trips. The richer the initial storehouse of ideas, impressions, and feelings that students have to select from, the richer will be the writing they produce.

3. Producing a written product takes time. In structuring writing assignments, there should be ample time for the actual writing to take place. Remember, too, that students not only write at different rates but that they approach writing in many different ways. Some may write almost immediately and write extensively only to revise and change later; others write in spurts and produce almost "polished" writing on the first draft. Their writing behavior also will vary depending on the nature of the task and how clearly they conceptualized their topic before beginning to write; also, some may like to "bounce ideas" off you while writing while others may prefer to be left alone.

4. The kind of response to their writing that students receive has a strong influence on how they approach future writing tasks. On the one hand, we know that the longer the period between the writing and the response, the less the response will likely help the student. On the other hand, we know that different students profit from different kinds of responses; some need large amounts of praise while others want to know only what was wrong, some are interested primarily in reactions to their ideas while others are concerned with both substance and form. The implications are clear: make every effort to respond to students' writing as soon as possible after it has been completed, and adjust your responses according to the particular learning stage or learning style of the writer. Neither is an easy task. Arranging teacher-student conferences after writing experiences is one means of providing prompt response and detailed personal feed back to each student.
5. Students generally will have more successful writing experiences when they know <u>what</u> they are trying to accomplish and <u>for whom</u> they are writing. It is important, then, to identify clearly and specifically the function or purpose for the writing (e.g., to record, to inform, to persuade, to develop a generalization, to offer an opinion, to develop a theory, to compare, to explain a process) and the audience for the writing (e.g., you as examiner, you as coach or guide, classmates, the principal, parents, students in other grades, community residents, members of local government). Before actually giving any assignment, it is useful to check to see that the function and the intended audience are clearly and directly indicated.

6. Just as it is important that students know why and for whom they are writing, it is also important that, if they are being evaluated, they know the evaluation criteria. Not all writing experiences should be "graded." In fact, it is desirable for students to have frequent writing experiences with response but not "evaluation" if learning to write is a genuine goal. However, when the writing is intended for evaluation purposes, both you and your students should know clearly what will determine the judgments to be made (e.g., content, form, content and form, coherence, vocabulary use, proper mechanics and usage). The object is to have students spend less time and energy trying to figure out what you will be evaluating and more time trying to communicate their ideas clearly and coherently. Being straightforward and open about the criteria for evaluation will help.

EVALUATING STUDENT KNOWLEDGE, ATTITUDES AND DECISION-MAKING SKILLS

Given the multiple objectives of the UEEP modules -- increased knowledge, more favorable attitudes toward environmental concerns, and enhanced decision-making skills -- multiple means of assessing and evaluating student learning are required. Students' learning and grades can be based on:

- extent and quality of participation in module activites
- completion of module worksheets
- brief writing assignments incorporated in the module activities (see "Guidelines for Structured Writing Activities")
- knowledge pretests included in each module (which also can be used as posttests following completion of module activities)
- teacher-made tests

In addition to the knowledge pretests that are included in each UEEP module, there are two general UEEP pre-posttests: an Attitude Survey and a Decision-Making Skills Test. These measures were developed for use in the field-testing and evaluation phase of the UEEP. They were administered to students before they used any UEEP modules and at the end of the school year to assess any changes in students' environmental attitudes and decision-making skills.*

We are including copies of the Attitude Survey and Decision-Making Skills Test here, with the caution that they are trial instruments not yet fully

*At this time, the attitude survey data have not been analyzed. Preliminary analyses of the Decision-Making Skills data indicate that students who used 5-6 modules showed significantly greater gains than did students who used only 1-2 modules.

refined. You might find them useful in their present or a modified form for assessing students' learning over time. Since attitude change and skill development are relatively long-term processes, significant change should not be expected in less than 3-4 months or with the use of fewer than 5-6 modules.

Attitude Survey

The attitude survey consists of 16 items to which students are asked to respond as follows:

1 = definitely yes

2 = probably yes

3 = uncertain

4 = probably no

5 = definitely no

Half of the items (1, 3, 5, 7, 9, 13, 14, 16) are general statements about environmental issues and concerns, and half the items (2, 4, 6, 8, 10, 11, 12, 15) are more specific or personalized statements. Since we tend to respond more favorably to general than specific statements, it may be useful to separately score and then compare students' responses to the two types of items. (Unless otherwise noted for a particular item, lower scores indicate more favorable attitudes.)

Directions: This is a survey of your feelings about the environment. Read each statement, and decide which of the following responses best describes how you feel.

1 = definitely yes
2 = probably yes
3 = uncertain
4 = probably no
5 = definitely no

Then, in the space beside each statement, indicate the number that best describes your feelings.

___ 1. Anti-littering laws should be strictly enforced to make our cities more attractive and healthier places for people to live.

___ 2. I am interested in learning more about environmental issues and answers.

___ 3. Automobile traffic should be limited to reduce air pollution.

___ 4. I am willing to conserve energy by using less heat in winter and less air-conditioning in summer.

___ 5.* Energy conservation is unnecessary because scientific discoveries will provide all the energy we need.

___ 6. I am willing to help reduce automobile traffic and air pollution by riding in a car pool or taking the bus more often.

___ 7. Energy resources such as fossil fuels must be conserved so that we do not run out of electricity.

___ 8. I am willing to stop littering in order to clean up the environment.

___ 9.* Environmental problems in our cities are too great to be solved.

___10. I am willing to work on a neighborhood project to make my community a better place to live.

___11. If all of us helped a little, energy and environmental problems could be solved.

___12. Making cities better places for people to live is important to me.

___13. Schools should have environmental education programs for all students.

___14. There is a real energy shortage in this country.

___15.* There is little I can do to help my community solve its environmental problems.

___16.* There is too much fuss made about air and water pollution.

*Negative item = reverse scoring.

Decision-Making Skills Test

The skills test consists of three sections. Each section contains a case study vignette, depicting an environmental issue or concern, followed by a series of eight multiple choice questions (24 items total). The first two questions in each series are intended to assess students' level of social reasoning in terms of Kohlberg's stages of cognitive-moral development. (Response options a and b represent lower levels; options c and d represent higher levels.) The remaining questions in each series tap students' skills in identifying issues (main ideas and related issues); distinguishing political, economic, and social environmental concerns; determining who (which individuals or groups) is likely to be affected in a particular case; recognizing needed information and appropriate sources; recognizing available options and situations where compromise is needed; inferring side-effects and likely consequences of alternative courses of action; identifying relevant sources of power or influence in a particular case; and distinguishing personal choices from public policy decisions.

Directions: This is a decision-making test. It consists of three cases or stories, followed by multiple-choice questions. Read each case story carefully; then read the questions that follow. Decide on the best answer to each question, and circle the letter of the answer you have chosen. Answer all of the questions as best you can.

Case A

Do you remember the winter of 1977? Joey remembers it as one of the coldest ever. In fact, the Weather Bureau said that it was one of the coldest winters on record.

To Joey, that winter did not seem so bad. There was a lot of snow and time off from school. It was harder on some people, though. Because there was a shortage of coal and other fuel, industries had to cut back production and lay off workers. This did not affect Joey's family, but a friend's father was out of work for awhile.

On television there were a lot of public service announcements about turning down your heat. Sometimes Joey's family did this and sometimes not. All things considered, they got by all right.

1. Joey's friend, Terry, said that their family kept the heat at 65° in their house all winter and that Joey's family should too. What do you think is the best reason to keep the heat turned down?

   a. If Joey's family doesn't keep their heat at 65°, they might use too much energy. The power company might shut them off.

   b. If Terry's family does it, Joey's family should too. They are friends and should stick together.

   c. If Joey's family does not keep their heat turned down, Terry will think that they are not doing their part for the energy crisis.

   d. Energy experts and government officials say we need to do this. We need to work together for everyone's benefit.

2. Joey's friend, Tony, said that their family kept the heat at 74° in their house all winter and that it doesn't matter whether Joey's family turns the heat down or not. What do you think is the best reason to keep the heat at 74°?

   a. The gas company and the government can't make you turn the heat down, so why not be comfortable?

   b. Other families like Tony's keep their homes warm. You will turn your heat down when they turn down theirs.

   c. If Joey's family turns down their heat, Tony will think that they are dumb to make themselves uncomfortable on purpose.

   d. There has always been enough fuel to heat houses. You can't believe that things will fall apart if you keep your heat at 74°.

3. What is the major environmental issue in this case?

   (a) energy

   b. neighborhood renewal

   c. pollution

   d. crowding and traffic

4. A major side-effect of the environmental issue presented in this case concerns

   a. safety.

   (b.) jobs.

   c. technology.

   d. social relations.

5. Who is probably hurt most in this case?

   (a.) industrial workers

   b. people in rural areas

   c. young people

   d. coal companies

6. Who has power to influence decisions in this case?

   a. rich people

   b. government officials

   (c.) all of us

   d. nobody

7. What would be the best source of more information about this case?

   (a.) newspaper articles

   b. utility company commercials and advertisements

   c. weather reports

   d. encyclopedias

8. Which of the following would be the most reasonable short-term response to the issue in this case?

   a. laws against pollution

   b. public service jobs

   (c.) conservation measures

   d. research on weather control

Case B

Ann looked out the back window of the car as her mother started the engine. A cloud of blue smoke rose from the exhaust pipe. It sometimes embarrassed Ann to ride around in a car that left a cloud of smoke behind it. Ann's mother said that they could not afford a new car, so that was that.

As they headed toward downtown on their way to the shopping center, Ann turned on the radio. The news was on, and the announcer was talking about the air quality. "The downtown air today is very unhealthful, with an index of 257. A second stage alert is in effect. Those with respiratory disorders should stay indoors and limit their physical activity and avoid the downtown district."

Ann looked out at the trail of smoke behind their car. If she and her mother drove through the downtown area, they would be adding to the already serious pollution. They could reach the shopping center by going around the downtown area, but the trip would take an additional half hour.

Should Ann ask her mother to drive around the downtown area?

1. If Ann asks her mother to drive around the downtown area, the best reason would be that

   a. a policeman might stop them because their smoky car was adding to pollution.

   b. Ann wouldn't want other people to pollute her neighborhood, so she and her mother should not add to the downtown pollution.

   c. Ann's mother will be proud of Ann for suggesting that they avoid polluting the downtown area.

   d. What if everyone drove downtown when it was polluted? Then the air would be really terrible.

2. If Ann does not ask her mother to drive around the downtown area, the best reason would be that

   a. the police can't make you leave downtown just because it is polluted.

   b. other people would drive through Ann's neighborhood, even though it is polluted, so Ann and her mother do not need to avoid the downtown area.

   c. Ann's mother will think it is a really dumb idea to drive an extra half hour just because of a little air pollution.

   d. no one else is avoiding the downtown area, so why should they?

3. What is the major environmental issue in this case?

   (a.) air pollution

   b. industrial noise pollution

   c. solid waste disposal

   d. energy generation

4. Other urban environmental issues in this case include all of the following, except

   a. traffic congestion.

   b. energy conservation.

   c. personal health.

   (d.) water pollution.

5. The issues presented in this case primarily involve

   a. technology and safety.

   (b.) health and convenience.

   c. economics.

   d. politics.

6. What is another reasonable choice available to Ann and her mother?

   a. stay home

   (b.) use public transportation

   c. buy a new car

   d. delay their trip for an hour or more

7. Reasoned decision-making often requires

   (a.) compromise.

   b. ignoring other people's interests.

   c. considering only immediate effects.

   d. luck.

8. Ann's decision in this case would be an example of

   a. a public policy decision.

   (b.) a personal choice.

   c. an educated guess.

   d. an authoritative recommendation.

Case C

Ed Johnson thinks of himself as a regular sort of person. He has grown up, married, and worked in the same neighborhood his whole life. This is the first time anyone ever asked his opinion about anything.

Ed has been appointed to the Community Advisory Board for City Planning. This is a group that gives the city advice about new building programs for the city. Most of the time this has been enjoyable and interesting for Ed, but today he faces some difficult choices. Today Ed must make a decision about his neighborhood.

The city and a large corporation want to tear down eight square blocks of the neighborhood to build an office and shopping center. They say it will bring a lot of jobs to the neighborhood. Ed knows that there are a lot of people out of work who would benefit by this.

The destruction of eight square blocks will change the neighborhood, however. Many of Ed's friends will have to move away. There will be a lot more traffic, too.

Should Ed, as a resident of the neighborhood and member of the Community Advisory Board, speak out in favor of the new office and shopping center? Or should he speak against it?

1. If Ed says yes, he should support the proposed office and shopping center, the best reason would be that

   a. Ed might find himself a better paying job in the new center.

   b. it will be good for the neighborhood. Ed would want some new job opportunities if he were out of work.

   c. the people of the neighborhood will thank him for bringing new opportunities to the neighborhood.

   d. the center is best for the whole city. Sometimes neighborhoods must compromise for the good of the whole city.

2. If Ed says no, he should not support the plan, the best reason would be that

   a. a neighbor who has his house torn down might try to get even with Ed.

   b. Ed's friends and neighbors have supported and helped him in the past. Now he should help them by opposing the plan.

   c. Ed's friends and neighbors will think that he is a bad person for not backing them up against the plan.

   d. the new office and shopping center will destroy the old neighborhood. It won't be like a neighborhood any more.

3. The major environmental issue in this case is

   (a.) quality of life in urban areas.

   b. overcrowding.

   c. air pollution.

   d. energy generation and conservation.

4. Other urban environmental issues in this case include all of the following, except

   a. traffic

   b. jobs.

   (c.) water pollution.

   d. relocation of people and families.

5. The issues presented in this case are primarily

   a. political.

   (b.) economic and human.

   c. physical and social.

   d. philosophical.

6. If the office and shopping center is built, who probably will be hurt least or not at all?

   a. peoples whose homes are torn down

   b. young people in school in the area

   (c.) people who are unemployed

   d. owners of small, neighborhood businesses

7. If you were Ed Johnson, what additional information would be most helpful to you in making a decision?

   a. when construction of the center would be completed

   (b.) how many people would be displaced by the center

   c. what stores would be in the center

   d. who would own the center

8. If Ed Johnson wanted to find out what a majority of the neighborhood residents preferred in this case, it would be best to

   a. go on a radio or TV talk show and tell people to call in their opinions.

   b. talk to his friends.

   c. ask community leaders.

   (d.) conduct a questionnaire survey.

MORE SOURCES AND RESOURCES

In addition to the student materials included in the UEEP modules (e.g., fact sheets, worksheets, graphics) and the accompanying transparencies (Decision-Making and other maps) and slide sets (air pollution for Module V, new towns for Module VIII), many others are listed under the Resources section of each module activity. The listed Resources include local sources of speakers, field trips, and free print and audio-visual materials -- check and plan ahead.

Since the UEEP modules were revised, many additional resources have come to our attention. Just a few of the more interesting ones are listed below. Also included here is the information script for the air pollution slide set, which goes with Module V but can be used with several other Modules as well.

The Center for City Building Educational Programs, 235 South Westgate Avenue, Los Angeles, CA 90049. 213/828-1895.
City Building Educational Programs is a teacher's guide to "urban focus activities" for environmental and "inventive citizenship" education.

Duquesne Light Co., 435 Sixth Avenue, Pittsburgh, PA 15219. 412/456-6278 (ask for John Wills)
Films and speakers on energy topics including energy generation, energy needs, and nuclear power.

Environmental Education Coordinator, Carnegie Museum of Natural History, 4400 Forbes Avenue, Pittsburgh, PA 15213. 412/622-3235
Environmental Learning: A Directory for Western Pennsylvania is an up-to-date (1979) annotated bibliography of people, places, and programs. It's well worth $1.00.

Vision, Inc., 678 Massachusetts Avenue, Cambridge, MA 02139. 617/491-3763
STREET SMART, materials about the "built environment" including posters, activity cards, filmstrips, and teacher's guide.

ACTIVITY 3. Blackout?

Objectives: Given the "Blackout?" chart of household electrical appliances and the hours of the day, students record the time of use for each item in their homes. After completing the chart, infer the effects of a limited power blackout on their lives and identify at least three changes in household practices that would result in electrical energy savings (and label them as either conservation or curtailment practices).

Organizing Ideas: Personal convenience as well as necessary household operation influence the amount of electrical energy used daily in the home.

1. Conservation
2. Curtailment

Resources:

Lengyel, Dorothy L., Wert, Jonathan, M., and Worthington, Barry K. Selected Energy Conservation Options for the Home. University Park, PA: Pennsylvania State University Cooperative Extension Service, 1978. This extensive listing of more than 125 energy conservation options is written in non-technical language and is available free on request from the Extension Service, Agricultural Administration Building, 16802.

Tips for Energy Savers. Bulk copies of this easy-to-read pamphlet are available free from the U. S. Department of Energy at either of the following addresses: "Tips" Distribution, Office of Administrative Services, Washington, DC 20545; Technical Information Center, P.O. Box 62, Oak Ridge, TN 37830.

Student Materials:

Handout (provided in the Student Materials Packet)

Blackout? (SM 3.1, 3.2, 3.3)

Suggested Procedures:

1. Part A is designed to be completed by students working individually with handout SM 3.1, in class or at home.

   a. By way of introduction, you might share the following information with students and solicit questions.

      Many people are not willing to give up certain comforts in order to conserve energy. In their own homes, people often feel that they do not have to give anyone any reasons why they use energy. Well, we may see a time when energy is not available for people to "do as they please." How would you feel for example, if there was no electricity to operate the TV? What would you do?

      The energy situation in the United States does not seem to be getting better. Both energy demand and prices are going up. The future availability and costs of energy sources remain uncertain. If we do not conserve, our energy "bank" will soon be almost (or completely) empty. By conserving energy, we can make our energy supplies last longer, and we will have more time to develop new energy sources and technology. Some estimates are that we could cut our energy use by 30 percent without too much difficulty or inconvenience.

      In this activity, you will check on electric use in your own home -- which appliances are used? When are they used? Consider how you might conserve energy, and some ways your life might change if there was less (or no) electricity available.

   b. Vocabulary that might be reviewed with students includes:

      Conservation -- voluntary reduction of resource use (in this case, voluntarily using less electricity).

      Curtailment -- complete stoppage of resource use, voluntary or imposed (in this case, nonuse of electricity during certain times or for certain purposes).

      Brownout -- reduction of electrical power supply from a utility station (affects some electric items).

Blackout -- complete shut-off of electrical power supply from a utility station (affects all electric items).

2. After students have completed Part A, the questions raised in Parts B, C, and D, SM 3.2-3, might be used as the basis for group discussion. Alternatively, students might be asked to respond in writing prior to sharing their ideas.

3. This activity might be extended by asking students to determine the approximate dollar energy savings for each change in electric power use they suggest. Such information usually is available from local power companies, for example: Duquesne Light Company, Box 2495, Pittsburgh, PA 15230. Also, having students combine and total their estimated energy savings would increase the impact of this activity. However, note that only about 20 percent of the energy used in the United States is used at home. With this additional information, students might re-evaluate their energy conservation and curtailment recommendations. For example:

   a. To what extent do the energy and dollar savings seem worth the other "costs" involved? (e.g., convenience, safety)

   b. We are basing our estimates on present energy prices. What difference would rising energy prices make? What else might happen? (e.g., declining energy use could result in higher prices as utility companies attempt to offset income cost through conservation).

   c. Emphasize the complexity of energy problems. While there are some things that we can do, there are no simple solutions. Further, it is unlikely that we can accurately forsee all the consequences of our actions--or inaction. (What we don't expect can happen.)

4. Another, optional follow-up would involve students in designing, conducting, and evaluating an energy use survey of the school. A report might then be made to the student government or school administration.

Blackout?

A. Listed below are electricity-using items that might be found in a contemporary American household. Across the top of the chart, the hours of the day and evening are numbered. Make an "X" in the boxes to indicate the approximate hours of a typical weekday that you or members of your family would usually be using each item.

TIME

Midnight Noon

ITEM	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
Dishwasher																								
Microwave Oven																								
Electric Range & Oven																								
Blender																								
Can Opener																								
Electric Clock																								
Automatic Coffeemaker																								
Toaster																								
Slow Cooker																								
Refrigerator																								
Vacuum Cleaner																								
Clothes Washer																								
Clothes Dryer																								
Space Heater																								
Water Heater																								
Color TV																								
B & W TV																								
Radio-Record Player																								
Power Saw																								
Electric Blanket																								
Hair Dryer																								
Electric Toothbrush																								
Room Air Conditioner																								
Electric Fan																								
Electric Furnace																								
Yard Light																								
Lamps & Lighting																								
Garage Door Opener																								
Other																								

B. Use your "Blackout?" chart to answer the following questions.

1. During what hours do you and your family use the largest number of electric items?

2. Which electric items are used all day (or all night) long?

3. In addition to the items you just listed, which ones are used more than six hours per day?

4. Which of the electric items seem necessary for your safety or comfort?

C. Imagine that it is the month of June and your local power company has scheduled an electric power blackout between 3:00 and 6:00 p.m., Tuesday through Thursday, in order to conserve limited energy supplies.

How would your daily life be affected? (List at least three ways in which your life would be different.)

D. To reduce the likelihood that we will be faced with power blackouts, what changes in electric power use might you, other members of your family, and members of your community make in order to conserve energy? (List at least three changes; then label each change that you have just listed as an example of conservation (CO) or curtailment (CU).

Slide Series: Air Pollution and Progress in Allegheny County

This series of 12 slides and accompanying script are intended to illustrate air pollution sources, consequences, and progress in the Pittsburgh area. The slides are particularly appropriate for use with Module V, Urban Air Quality: At What Costs? They also might be used with Module VII, Urban Ecology: Our Future Together, and Module VIII, Planning Your Urban Environment. The cooperation of the following agencies in providing slides for use here is acknowledged and appreciated:

Allegheny County Bureau of Air Pollution Control

Group Against Smog and Pollution (GASP)

Jones and Laughlin Steel

U. S. Steel

Slide 1. On a clear day in Pittsburgh, the sky, hills, river(s), buildings, and steel mills look picturesque. In the 1940's however, there were few clear days in Pittsburgh. It was known as the "Smoky City."

Slide 2. The photo on the right shows the smoke and air pollution from the steel mills in the 1940's. Today, with air pollution control devices, the same mill can look like the photo on the left. (What differences do you see?)

Slide 3. This close-up view of two smoke stacks shows former and present practices and resulting air quality. In the past, many tons of particulates (soot and ash) entered our air. Today, these emissions have been significantly reduced.

Slide 4. Pittsburgh is no longer the "Smoky City." But, a definite haze is still evident even on sunny days. In this view, looking east from downtown, the distant hills are barely visible.

Slide 5. Evening commuters, homeward bound on the Liberty Bridge, also can experience the pollution that develops in the downtown area. Downtown air quality is affected mainly by gasoline engine exhaust.

Slide 6. This photo shows steelmaking operations in the 1940's. Sometimes the red-orange smoke would light up the night sky in Pittsburgh.

Slide 7. Red-orange smoke is not completely a thing of the past. Today, some smoke is still emitted from steel mills in the Pittsburgh area.

Slide 8. Polluted air is pushed along by winds. Pollutants can end up miles from their source, damaging property, wildlife, and people.

Slide 9. Here, the area around the Clairton Coke works seems to be surrounded by fog. The pollution is so heavy that, when the winds are calm, the air around the plant becomes thick and parts of the buildings are hardly visible.

Slide 10. The air quality here seems to be extremely poor. The pollutants give the air a blue-gray hue. This photo was taken shortly before a rainstorm.

Slide 11. In the same area, after a rainstorm, the air quality seems to have improved. The haze is gone, and only lingering rain clouds are visible.

Slide 12. This map shows some of the major air quality monitoring stations in Allegheny County.

How likely is Pittsburgh to return to the "Smoky City" days? How much can we depend on wind and rain to lessen air pollution? How adequate are present air quality standards? What are the (economic and other) costs of clean air? These are just some of the questions that many people are asking now. The answers will affect our future.